

Scorpion Brushless Controllers User guide for Commander 15V ESC series



SAFETY

- ⚠ Scorpion and their re-sellers are not responsible for your use of this product, or any damage or injuries you may cause or sustain as a result of its usage.
- ⚠ Understand that an electric motor that is connected to a battery and speed control may start unexpectedly and cause serious injuries. Always treat them with necessary respect. Keep the propeller away from your body and others at all times.
- ⚠ We suggest that you remove the propeller when you are working on the plane with the battery connected.
- ⚠ We suggest that you remove the pinion when working on a Helicopter with the battery connected
- ⚠ Please observe all local laws regarding the flying of remote control aircraft.
- ⚠ Never fly over others or near crowds.

Included in the BOX

- 1 x Scorpion LBEC ESC
- 1 x Program card
- 1 x Instruction Manual

Battery Eliminator Circuit (BEC)

The Commander 15V LBEC series feature a Linear BEC that will convert the voltage from your battery pack to 5.0 volts to power your receiver and servos. The Commander SBEC will deliver 4 amps of continuous current. The Linear BEC will operate from 6 to 15 Volts

1.0 Connecting your ESC



*for larger picture refer to back of this manual

1.1. Add your battery connector

You must attach a quality battery connector of your choice to the red (+) and black (-) power wires. Solder the battery connector to the wires. ENSURE THAT THE POLARITY IS CORRECT (red wire to battery red wire, black wire to battery black wire). Follow the instructions provided with the battery connector.

1.2 Connect Motor to ESC

Cut the three (red, yellow & black) motor wires coming off the ESC to the length you require. We recommend using bullet connectors to connect your esc to your motor as scorpion motors come with pre-installed bullet connectors that include a female set for your ESC. Solder the corresponding connectors for your motor to the wires coming from the ESC, or solder the motor wires directly to the motor leads. You may find it convenient to temporarily connect the motor leads to the ESC and test for proper rotation before you permanently solder them. See "Reversing Rotation" below. Once connected DO NOT allow any exposed wire or connectors to contact each other, insure that proper insulation around each of the three wires is achieved, Heat shrink is the best material for this job.

1.3 Connect to your receiver

Connect the receiver lead (the three colored small wires with a black plastic connector on the end) to the throttle channel on your receiver. Do not connect a receiver battery pack to the receiver, as the Scorpion ESC will supply power to the receiver and servos through the receiver connector.

1.4 Reversing Rotation (if necessary)

Bench test the motor and speed control after the connections are made to determine the rotation of the motor. To change the rotation of the motor, swap ANY two motor wire connections, or use the scorpion programming card included with your esc to change the rotation direction.

1.5 Mounting the ESC

Mount the ESC with the Heatsink side of the controller facing outward. We recommend using Velcro to attach the ESC to the airframe for easy removal. Double sided tape is also acceptable. If zip ties are used, do not place them over any of the components on the ESC. Instead, zip tie around the motor and battery wires, leaving some slack to allow for movement.

2.0 Using your scorpion ESC

2.1 Ensure that the ESC is connected to the proper channel on your receiver.

2.2 Turn your transmitter ON and set the throttle stick to zero throttle.

2.3 Connect the main power battery to the speed controller.

2.4 The ESC will beep the motor (4 tones) to indicate that it is armed.

6.1 Plug the Speed Controller signal lead into the ESC connection on the Programming Card, take care to note the proper polarity. The word "Black" is printed on the edge of the connector that corresponds to the black or brown wire of your ESC lead. The ESC connection is the one closest to the 2 DIP switches as shown in Figure 1 above.

6.2 Make sure that there is a motor attached to the output leads of the ESC, and then plug a battery pack into the input leads of the ESC. If you are running your ESC in Opto-Coupled mode, you will need to plug an additional 4-cell receiver pack battery into the Auxiliary Battery Connection shown above in Figure 1. The word "Black" is printed next to the edge of the connector to show the proper polarity for plugging in the auxiliary battery.

6.3 To use the default ESC parameters, set DIP 1 to the Off position. This disables the rest of the switches, and will load the factory default settings. To allow users selected settings set Switch #1 to the on position, and set the rest of the DIP switches to the proper positions as shown the next page to obtain the desired settings.

6.4 Once the settings are selected, push the button labeled SW2 for 2 seconds and release. You will hear a tone come from the motor. Next, push the button labeled SW4 for 2 seconds and release. You will hear a second tone come from the motor, and that completes the programming sequence.

Unplug the Programming Card and Auxiliary battery if used, and plug the signal lead from the ESC back into the throttle channel on your receiver noting the proper polarity.

7.0 Switch Position Guide

| DIP Switch 1 | |
|------------------|------|
| | DIP1 |
| Factory Default* | Off |
| User Select Mode | ON |

| DIP Switch 2 | |
|--|-------|
| Battery Type Selection (Default = Li-Po) | |
| | DIP 2 |
| NI-CAD/Ni-MH | Off |
| Li-Po* | ON |

| DIP Switch 3 - 6 | | | | |
|---------------------------------------|-------|-------|-------|-------|
| Cell Count Detection (Default = Auto) | | | | |
| | DIP 3 | DIP 4 | DIP 5 | DIP 6 |
| Auto Detect* | Off | Off | Off | Off |
| 2-Cell Li-Po | On | Off | Off | Off |
| 3-Cell Li-Po | Off | On | Off | Off |
| 4-Cell Li-Po | On | On | Off | Off |

| DIP Switch 7 & 8 | | |
|---|-------|-------|
| Battery Low Voltage Cutoff (Default = 3.0v/0.85v) | | |
| | DIP 7 | DIP 8 |
| Li-Po/Ni-XX | | |
| 2.9v/0.80v | Off | Off |
| 3.0v/0.85v* | Off | On |

| | | |
|------------|----|-----|
| 3.1v/0.90v | On | Off |
| 3.2v/0.95v | ON | On |

DIP Switch 9

Power Cutoff Type (Default = 50% Reduction)

| | DIP 9 |
|----------------------|-------|
| Hard Cutoff | Off |
| 50% Power Reduction* | ON |

DIP Switch 10

Current Overload Protection (Default = On)

| | DIP 10 |
|----------------|--------|
| Protection On* | Off |
| Protection Off | ON |

DIP Switch 11 & 12

Motor Braking Type (Default = Soft Brake)

| | DIP 11 | DIP 12 |
|--------------|--------|--------|
| No Brake | Off | Off |
| Soft Brake* | On | Off |
| Medium Brake | Off | On |
| Hard Brake | On | On |

DIP Switch 13 & 14

Motor Acceleration Time (Default = 0.3 Sec)

| | DIP 11 | DIP 12 |
|--------------|--------|--------|
| 0.15 Second | Off | Off |
| 0.30 Second* | On | Off |
| 0.60 Second | Off | On |
| 1.00 Second | On | On |

DIP Switch 15 & 16

PWM Control Frequency (Default = Auto)

| | DIP 11 | DIP 12 |
|--------|--------|--------|
| Auto* | Off | Off |
| 8 KHz | On | Off |
| 16 KHz | Off | On |
| 32 KHz | On | On |

DIP Switch 17, 18 & 19

Timing Advance (Default = Auto)

| | DIP 17 | DIP 18 | DIP 19 |
|------------|--------|--------|--------|
| Auto* | Off | Off | Off |
| 5 Degrees | On | Off | Off |
| 15 Degrees | Off | On | Off |
| 25 Degrees | On | On | Off |

DIP Switch 20

Motor Direction (Default = Forward)

| | DIP 20 |
|----------|--------|
| Forward* | Off |
| Reverse | On |

Factory Default settings marked with *

